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# BOREDOM AT WORK: IMPLICATIONS FOR THE DESIGN OF JOBS WITH VARIABLE REQUIREMENTS









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# BOREDOM AT WORK: IMPLICATIONS FOR THE DESIGN OF JOBS WITH VARIABLE REQUIREMENTS

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Jobs with variable requirements such as security guard positions involve long periods of relative inactivity or the performance of repetitive tasks interrupted by emergencies demanding alertness and rapid and accurate decision-making. They are particularly difficult to staff because those people who are most able to cope in emergencies are probably most likely to be bored during normal conditions. This report reviews the literature on work-related boredom and integrates what is known about worker characteristics, objective characteristics of the task, and subjective feelings about the job that are related to being bored at work. Repetitiveness, reduced complexity, constraint, and underutilization of skills contribute to job-related boredom. People who are intrinsically motivated, who introduce change into the situation by varying aspects of the job, or who are active daydreamers or visualizers are less bored or better able to cope with boredom when it occurs. Approaches that hold promise for decreasing boredom include selecting people with high tolerance for boredom, training them in coping techniques, emphasizing the importance of the job or career development, increasing self-control over how the tasks

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are performed, and redesigning the jobs by increasing complexity or decreasing constraint. Because boredom has not been the topic of much research, the results of the review were limited to the identification of hypotheses that require further testing.

## FOREWORD

This study was conducted for the Defense Nuclear Agency (DNA) under Program Element 62715N, DNA Task Code B99AQXRF, Technology Development, Work Unit Code 00055, MIPR 84-511, Occupational Structures. The work was performed under contract with Battelle Memorial Institute through the Department of the Army Scientific Services Program Contract DAAG29-81-D-0100. Marjorie H. Royle was the Contracting Officer's Technical Representative for the Scientific Services Program contract.

The purpose of the occupational structures research effort is to determine the optimal occupational structure, over both the short- and long-term for producing a cadre of trained, experienced personnel for protection of nuclear weapons. This report is the second in a series discussing issues related to nuclear weapons security jobs. It focuses on what is reported in the research literature on boredom that could be applied to job structuring for nuclear weapons security personnel. It also identifies areas in which further research is needed to discover ways of alleviating the effects of boredom on such jobs. The first report, HFOSL TN 85-71-07, described perceived training needs of nuclear weapons security personnel. Subsequent reports will deal with job requirements, the impact of new technology, and specific staffing recommendations.

Unlike the other reports in the series, this report has relevance to a wide variety of jobs both in the military and in the larger world of work. It presents implications for staffing a variety of boring jobs as well as directions for additional research.

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## SUMMARY

### Problem

Jobs with variable requirements, such as monitors or guard positions, present a difficult staffing problem. Most of the time they are characterized by reduced stimuli, social isolation, extreme repetitiveness, and low skill requirements. Yet, under emergency conditions, they require high levels of training, rapid decision-making, and alertness to produce the appropriate response. Staffing them with the caliber of person needed to respond to emergencies may result in boredom for most of the workers much of the time. Such boredom, however, may be detrimental to overall work performance, particularly to those tasks requiring vigilance.

### Objective

The objective of this literature search was to investigate work-related boredom and suggest methods for enriching, staffing, and motivating performance on boring jobs.

### Approach

Research in the area of boredom at work was reviewed. From this, a preliminary model of job-related boredom was developed to bring together all of its components. Implications for personnel selection and job design were developed.

### Findings

Because boredom has been a neglected research topic, the literature review resulted in hypotheses that need to be tested rather than clear findings. These are:

1. The complex structure of boredom includes components of arousal level, feelings of fatigue, monotony, constraint, unpleasantness, and distorted time. No single component provides a full explanation for the phenomenon of boredom.

2. Boredom is best considered as a multidimensional construct. These dimensions reflect its outward form (listlessness or apathy versus restlessness) and its type of occurrence (responsive or chronic).

3. Highly-qualified persons are somewhat more likely to be bored, but their performance is less likely to suffer.

4. Both gender and age are related to boredom, with younger males the most likely to become bored.

5. Individuals who are intrinsically motivated find boring situations more tolerable.

6. A personality trait measure of boredom-proneness appears less useful for predicting boredom at work than situational variables.

7. Both subjective and objective job characteristics impact boredom. Job characteristics of repetitiveness, reduced complexity, insufficient stimulation, isolation, constraint, subjective unpleasantness, and extreme predictability contribute to the experience of boredom. Among subjective characteristics, underutilization of skills is a major contributor.

8. People attempt to cope with boredom in several ways, including varying aspects of the job itself, such as the speed of their performance, and varying aspects of the situation by talking, moving, or mentally escaping through daydreaming or rehearsing for an emergency.

Several approaches hold promise for decreasing job-related boredom, although they need to be tested. They include:

1. Selecting people with high tolerance for boredom or with low levels of neuroticism.

2. Selecting people with a predisposition for visualization followed by training to channel those thoughts into rehearsals of emergencies.

3. Redesigning boring jobs by increasing the frequency, complexity, or variety of stimuli or decreasing feelings of constraint.

4. Modifying subjective job characteristics by emphasizing career development, the meaning or importance of the job, and, whenever possible, by allowing control over how the tasks are performed.

5. Training individuals in coping techniques such as building variety into tasks.

## Conclusions

1. Although the concept of job-related boredom is not fully understood, its study appears useful for improving performance on low-stimulus jobs as well as worker satisfaction with those jobs.

2. A theoretical model of job-related boredom that incorporates worker characteristics, objective task variables, subjective job characteristics, and coping strategies is useful for organizing the literature and for developing recommendations.

3. Although several approaches to combating job-related boredom are suggested by the literature, they require further testing in the laboratory and in the field.

## Recommendations

Further research is recommended in several areas:

1. Basic research on job-related boredom, measuring its components by self-report and by analyzing job and task variables so that the relative importance and interaction of the components can be determined.

2. Laboratory and field studies to explore the effects of training in coping skills, such as increasing intrinsic motivation or rehearsing for emergencies.

3. Field studies of the effects of interventions such as changing shift length or increasing job meaning within specific populations such as nuclear weapons security guards.

## CONTENTS

# INTRODUCTION

## Problem

Jobs with variable requirements, such as monitors or guard positions, present a difficult staffing problem. Most of the time they are characterized by reduced stimuli, social isolation, extreme repetitiveness, and low skill requirements. Yet, under emergency conditions, they require high levels of training, rapid decision-making, and alertness to produce the appropriate response. Staffing them with the caliber of person needed to respond to emergencies may result in boredom for most of the workers much of the time. Such boredom, however, may be detrimental to overall work performance, particularly those tasks requiring vigilance.

## Objective

The objective of this literature search was to investigate work-related boredom and suggest methods for staffing, enriching, and motivating performance on boring jobs.

## Background

Although boredom on the job is a fact of life for millions of workers, it has been largely ignored as a research topic. This paucity of research reflects a tendency to view boredom as an indication of individual failure or idiosyncratic flaw rather than a matter of social or organizational concern. Currently, however, trends such as increased work-place automation are providing an impetus to investigate the effects of monotonous, stimulus-poor tasks on individuals and organizational effectiveness.

The concept of boredom may offer an advantage over the more commonly used concept of job satisfaction in studying lower-level jobs because it offers a more pragmatic approach to job enrichment. Job satisfaction has not proven to be a reliable predictor of either performance or worker frustration. Perhaps because one's work is so central to life, reporting dissatisfaction with work may be equivalent to admitting failure in life. The resolution of cognitive dissonance may require that individuals believe they are satisfied despite symptoms of discontent. The assessment of boredom, related as it is to dissatisfaction and stress on the job, may provide greater insight into many of the problems associated with low-level jobs as well as into potential solutions.

Boredom has been variously identified as low arousal, high arousal, feelings of unpleasantness, constraint, fatigue, monotony, stress, or a distorted perception of time. This profusion of definitions has been a major obstacle to integrating various research efforts. Two recent review articles, one by Smith (1981) and another by O'Hanlon (1981), have helped unify various approaches to the problem. O'Hanlon's definition of boredom as a "unique psychophysiological state processing interrelated and inseparable emotional, motivational, perceptual and cognitive concomitants" (p. 53) is the most comprehensive to date. Exploratory studies by Sundberg and Bisno (1983) support the uniqueness of boredom as an independent construct and distinguish it from other closely-related concepts or psychological states.

Although some relevant research has been performed, the literature on boredom is scattered throughout widely disparate sources. Integration of existing research into a coherent model is needed to describe the structure of boredom and the relationships of its components. Only then can a systematic approach to further research on the causes of work-related boredom be taken and interventions to prevent it be designed.

## APPROACH

To discover what is known about boredom that might be useful in devising strategies to combat it on the job, a literature review of relevant theoretical and empirical studies was performed. From this review a preliminary model of job-related boredom was developed to bring together all of its components. Implications for personnel selection and job design were developed.

## REVIEW OF RESEARCH AND THEORY

This summary of literature on boredom is limited by the nature of the research itself and by the purposes of the review. Because most conceptualizations of boredom emphasize its association with changes in cortical arousal, arousal theories are prominent. Also, the focus of this review on work-related boredom limits its treatment of situational factors to job and task variables. For this same reason only minimal attention is given to problems of chronic boredom.

### Consequences of Boredom

The prevalence of boredom in our culture and in the work place should provide the impetus for behavioral scientists to seek increased understanding of the phenomenon and how it affects quality of life. The available evidence suggests that in addition to being widespread, job-related boredom has considerable negative impact upon organizational goals and societal functioning as well as upon individual health and well-being. Its consequences can be seen in performance decrements and changes in attitude and in physical and cognitive functioning occurring within the individual. Each of these changes suggests an area where more research is needed to understand fully the effects of boredom and the conditions under which they occur.

#### Effects on Performance

Although boredom is generally assumed to impact performance negatively, conclusions about the effect of boredom on performance have often been reached by assessing performance over time on tasks assumed to be boring rather than by directly measuring boredom itself. Performance efficiency under boring conditions is apparently related to the amount of effort expended, although the person successful in maintaining performance pays a higher toll in the level of irritation, fatigue, and physiological changes experienced as increasingly greater effort is required.

Lowered performance on boring jobs is generally attributed to shifts in attention away from the task. Theories of arousal suggest that attentional shifts may be a function of increased reticular activation initiated to break up perceptual sets. (See Cox, 1980, for a comprehensive summary of how an arousal-attentional mechanism mediates the monotony/performance relationship.) Alternately, shifts in attention may represent a deliberate behavioral compensation for a decrease in arousal. Still unresolved is the question of when, and under what conditions, brief attentional shifts may fulfill an adaptive function without detrimental effects. Also, the extent to which boredom is reflected in a performance decrement probably depends more upon the interaction of the task demands with the coping strategies of the person than upon individual skill level, yet practically no research has been done in this area.

Mechanical assembly, inspection and monitoring, and continuous manual control are the principal kinds of tasks most frequently studied by researchers investigating the relationship between performance and presumed boredom. On the most repetitive tasks, degradation of performance has typically been found within 30 minutes (Fox & Embry, 1975; Saito, Kishida, Endo, & Saito, 1972). The early studies of the British Industrial Fatigue Board (Wyatt & Fraser, 1929) concluded that the worker's experience of boredom could be identified by a characteristic output curve on mechanical assembly jobs. The magnitude of boredom was inversely related to output and was usually marked by a sharp decrement in the middle of a work period. Neither Smith (1953) nor Murrell (1971), however, found output curves to be useful in identifying bored workers in their samples; work curves did not reliably predict either self-reports of boredom or behavioral indices.

When the assembly task is of the paced variety so that output remains relatively constant, performance is assessed in terms of "misses." Manenica and Corlett (1977) sought to relate such "misses" to cardiac or respiratory measures but were unable to establish a consistent pattern.

A similar time-related decrement in performance has been noted on jobs demanding continuous vigilance and perceptual discrimination, such as inspection and monitoring tasks. In one of the few attempts to relate such a decrement to boredom, Thackray, Bailey, and Touchstone (1977) measured performance, physiological changes, and reported boredom during a complex monitoring task. A high-boredom group showed a greater delay in responding than did a low-boredom group, but the groups did not differ significantly in the number of critical stimuli missed. The duration of the task was only one hour, however.

In general, the complexity or variety of stimulation is related to reported boredom and maintaining performance on a monitoring task, but the complexity of the discrimination (task) is not. Repetitive monitoring tasks can be either simple or complex and still be boring. Because cognitive demands are determined by the complexity of the discrimination, abilities predictive of adequate performance are likely to vary with the task regardless of the experience of boredom. On a low-demand task, Forbes and Barrett (1978) found that ability measured by the Group Embedded Figures Test predicted response time but not errors. For a more demanding task, performance was best predicted by a combination of abilities, including general intelligence and selective attention as well as the results of the Embedded Figures Test.

Numerous investigators have studied performance on continuous manual control tasks such as operating an aircraft under instrument flight conditions or an auto over long distances of open road. Because both situations are characterized as monotonous, boredom is considered intense. Results have consistently shown that either performance deteriorates within a relatively short time but can be temporarily restored by a brief rest period or the effort to maintain performance causes rapid growth of feelings of irritability and aversion to the task. Frequent lapses of attention occur during which the operator may do nothing and allow tracking error to mount. On driving tasks, tracking efficiency improves when increased speed or traffic density provides additional stimulation (O'Hanlon & Kelley, 1977).

In studying long-distance truck drivers, Drory (1982) found that greater boredom led to more frequent absenteeism and to reduced concentration as reflected in negligence and property damage. Boredom was more strongly related to accidents than to absenteeism, leading Drory to conclude that one's state of alertness is more affected by boredom than one's attitudes toward the job. He also found that the negative effects of boredom were

The strategies that workers use to cope with a boring job are as individual as the people themselves and no discussion of strategies can ignore the less benign forms they may take. Much has been written about the problem of workers who block out monotony with alcohol and drugs. Reports of letting the line go by without performing one's task, letting errors go uncorrected because they are someone else's responsibility, and instigating sabotage are frequent. Sabotage often takes very clever forms, making use of creative energy that is neither demanded nor desired in the performance of a task. Nevertheless, most people probably want to do productive work. As Garson (1975) concluded, "Whatever creativity goes into sabotage, a more amazing ingenuity goes into manufacturing goals and satisfactions on jobs where measurable achievement has been all but rationalized out" (p. xi).

Summary of Findings

Boredom at work is responsible for much reported dissatisfaction and is implicated in lower productivity, maladaptive job behaviors, poor quality control, and physical complaints. Further, prolonged job-related boredom may have a pervasive effect on the overall quality of life of the individual. The concept of boredom provides a more pragmatic approach to work-related problems associated with some lower-level jobs than does the more commonly used concept of job satisfaction and promises to be a useful adjunct to motivational theories.

Boredom has been a neglected research topic. The construct itself continues to generate considerable controversy. In the most comprehensive definition, boredom is seen as "a unique psychophysiological state possessing interrelated and inseparable emotional, motivational, perceptual, and cognitive concomitants" (O'Hanlon, 1981, p. 2). Much more research is needed to clarify how these component parts are related and to specify rules for person-job interactions. The need for additional research (especially field studies) becomes more urgent as technological advances bring rapid changes in the design of jobs. The implementation of new technology without sufficient consideration for the human side of work may have consequences that will negate its promise.

Because progress in technology is not likely to await the results of such studies, the organizational scientist must proceed on the basis of some relatively strong theoretical assumptions. At this stage, such research findings can best be summarized in the form of several hypotheses which require further testing:

- The complex structure of boredom includes components of arousal level, feelings of fatigue, monotony, constraint, unpleasantness, and distorted time. No single component provides a full explanation for the phenomenon of boredom.

- Boredom is best considered as a multidimensional construct. These dimensions reflect its outward form (listlessness or apathy versus restlessness) and its type of occurrence (responsive or chronic).

- Highly-qualified persons are somewhat more likely to be bored, but their performance is less likely to suffer.

- Both gender and age are related to boredom, with younger males the most likely to become bored.

- Individuals who are intrinsically motivated or have an autotelic orientation find boring situations more tolerable.

most proficient tending to vary response times both on a laboratory task and by maintaining the least consistent engine speed on long runs.

To help offset the effects of monotony and repetitiveness, some individuals introduce private games into task performance. For drivers, this may involve changing patterns of lane use, using alternate hands, or waiting until the last minute to signal. On assembly lines, one popular game is to let work fall far enough behind so that extraordinary effort is required to catch up or, alternately, to work as fast as possible in order to get ahead and "work up the line" (Runcie, 1980).

Subsidiary Behaviors

As coping strategies, subsidiary behaviors include a variety of overt activities such as talking, singing, stretching, looking around, changing positions, and hand movements (rubbing or shaking one's hands, touching hair, mouth, or nose, etc.). These behaviors increase throughout a work shift, beginning as quickly as 30 minutes after a worker begins a monotonous task. When machine pacing on an assembly task was such that subsidiary behaviors could not occur, both physiological changes associated with boredom and performance decrements were greater than when assembly tasks permitted such behaviors to occur (Kishida, 1973, 1977).

The opportunity to talk with others while carrying out a monotonous task not only offers additional stimulation and some escape from boredom, but may also be motivating in itself for those who value social exchange at work. Walsh (1980), reporting on interviews with women who worked 20 years performing a simple, repetitive task of stuffing mattresses, found that they were high in job satisfaction because the monotonous nature of the work allowed them to talk all day without it affecting their output. Although some boring jobs must be performed under conditions where noise or placement of work stations makes conversation impossible, frequent anecdotal reports indicate that in many others talking would be possible but is not allowed. Even that type of prohibitive situation is probably preferable to tasks performed in isolation, because some workers add a dimension of interest to their jobs by attempting to talk without getting caught. Isolated tasks, on the other hand, provide no stimulation from conversation, eye contact with others, or the challenge of trying "to beat the system."

Ideation, Daydreaming, Fantasizing, Rehearsing

"There's not much you can do, I guess. You just do the work. . . daydream, that's the best. . . ." reported an auto assembly worker when asked what he normally did to counteract the boredom experienced on his job (Runcie, 1980). Workers in a wide variety of jobs have responded similarly often enough to suggest that the most common strategy for adapting to monotony is to withdraw into daydreams and fantasy. That is, individuals will shift attention from external to internal stimuli in order to reduce boredom in an environment where the stimuli are constant. Some individuals are more adept at this kind of covert stimulation than others. For example, in the Tushup and Zuckerman (1977) study, persons scoring higher on a trait measure of fantasizing were more likely to have vivid daydreams in a boring situation.

Workers with a tendency to daydream who enjoy their fantasies may report less boredom than those performing the same tasks who do not engage in internalized activity. Whether daydreaming actually decreases boredom or not, it may help the individual to adapt when no other means to increase stimulation are available. It may also be maladaptive, of course, on jobs that require vigilance or attention to detail.

when nothing happens. For some individuals, having nothing to do may be more boring than frequently repeating the same event. An increased awareness of time or perception of time-drag may also result and contribute to unpleasantness in such situations. Instrument monitors, long-distance truck drivers, and security guards in some settings might all experience boredom resulting from long cycle times combined with few events, while assembly line workers would experience few events in a much shorter cycle.

Restricted Movement. Restricted movement contributes to constraint on two levels. First, task characteristics on some jobs may impose considerable physical contraint on the worker. Standing in a sentry box, sitting at a monitoring console, or spending hours in long-distance driving are examples of jobs which restrict freedom of movement. In a more subtle sense, almost all jobs impose constraint because of the need for workers to be at a workplace during specified hours. Whether that level of restriction contributes to boredom seems to depend upon the individual maintaining sufficient interest or involvement to overcome the desire to be elsewhere.

### Person-Job Fit

The experience of boredom may differ greatly for individuals doing the same type of work because of the goodness-of-fit between individual and job characteristics. The cross-occupational study by Caplan et al. (1980) used measures of discrepancy between what the environment supplied and what the individual preferred to determine person-job fit. Although 42 percent of the variation in boredom was accounted for by occupation alone, one of the best predictors of within-occupation variance was poor fit with job complexity.

Csikszentmihalyi's (1975) model of the autotelic "flow" experience emphasizes the relevance of the person-job situation on yet another dimension. That model predicts that flow will occur when demands of the activity and individual ability or skill are congruent. It further predicts that anxiety will occur when demands of the activity exceed the skill of the individual, while boredom will result if activity demands fall appreciably below the individual's skill level. This model reflects the relationship between underutilization and boredom (and underutilization and job dissatisfaction) reported in field studies.

## Coping Strategies

The experience of boredom may also vary among individuals because some have better strategies with which to cope with boring situations. Primarily, these include ways to introduce additional stimulation into a restricted stimulus field. The frequency of a coping behavior is probably determined by the individual's point of optimal arousal. Personal preference and constraints in the task will determine the form of escape employed. Response variation, subsidiary behaviors, and daydreaming are among the most common.

### Response Variation

Response variation is a strategy for coping with boredom by attempting to build variety into the task itself rather than to increase arousal external to the task. On some tasks, response variation may involve only simple alternation behaviors, such as reversing the order in which subtasks are performed; on others, the variety may take more subtle forms reflected in an inconsistency of response times. One study of long-distance truck drivers (McBain, 1970) illustrated this inconsistency, with those who were least bored and

surgery suggests that even those surgeons who find their profession most fascinating occasionally experience boredom in their work. They associate boredom with one of three situations: performing operations that are considered "very routine," performing the mechanical procedures involved in the surgery (such as closing the incision), or functioning as an assistant. In each situation, the surgeon's skill is not challenged or utilized at an optimal level. Thus, although millions of workers in lower-level jobs would fail to see any similarity between their work and that of a surgeon, at least one of the eliciting conditions of boredom is the same for both.

Underutilization of abilities was the best predictor of job-related boredom ($r = .59$) in a sample drawn from 23 different occupations (Caplan et al., 1980). That relationship also held when data were analyzed at the organizational level (i.e., a similar correlation was found between average scores of boredom and underutilization for occupations). Not surprisingly, occupations with the highest scores on boredom included assemblers on machine-paced lines, forklift drivers, machine tenders, and nonpaced assemblers. Occupations with the lowest average scores on boredom were professors and physicians. Other task variables associated with boredom were job complexity and, to a lesser extent, level of participation and responsibility for others. This research confirms conventional wisdom about the nature of jobs that are the most boring. A productive next step might be to develop criteria for rating objectively the potential for boredom for any job.

The Potential of Tasks to Produce Boredom

Knowledge of occupational category or title alone indicates the incidence of boredom only in a general way (e.g., assembly line workers are more bored than professors). The potential for boredom in a specific job may be determined by the components of boredom that are represented. While the pattern of components or factors may vary from one job to another, their effects are probably cumulative. An analysis of the job with regard to those components can serve as a useful index for comparing the boredom potential across a broad spectrum of jobs, providing a more precise basis for explaining the discrepancies in reported boredom within job classifications.

Among the hypothesized components of boredom, arousal and unpleasantness are more closely identified with subjective states of the individual than with task variables. On the other hand, task variables may have a direct impact on fatigue, monotony, constraint, and time perception. Task dimensions reflecting those components include complexity, repetitiveness, task cycle time, and restricted movement.

Complexity. This dimension can be measured by the number of events or stimuli within a task cycle. On mechanical assembly tasks, for example, the number of events would be the operations performed by the individual on a single unit of production.

Repetitiveness. A boring job might include one or several tasks occurring regularly. For multiple tasks the complexity within each remains constant but some variation between tasks is introduced. As an example, data entry clerks might input information for several slightly different forms within the same unit of work or during different periods of the day.

Task Cycle Time. A short cycle time provides frequent exposure to repetitive stimuli. However, if the same number of events are spread over a longer period, a different factor of boredom may be introduced, that is, long stretches of "empty time"

characteristics should be considered in planning and implementing job enrichment strategies. If some aspects of autotelic or "flow" activities can be incorporated into a job, then intrinsic motivation can become a powerful incentive.

In conjunction with his conceptualization of autotelic activities, Csikszentmihalyi also suggested an autotelic personality trait that may distinguish the individual who consistently attaches more importance to intrinsic rewards than to extrinsic outcomes. Preliminary efforts to define such a personality dimension have met with little success in replication, however. Research generally supports the hypotheses that:

1. Older people, females, and those with higher socio-economic backgrounds are more likely to perceive intrinsic rewards as more important, but only to a slight degree.

2. Those who are involved in more creative and less competitive activities enjoy intrinsic rewards more.

3. The predisposition to value intrinsic reward may either precede or follow the experience of an autotelic activity.

Development or facilitation of an autotelic orientation through innovative training experiences might be useful as well as identification of those individuals most resistant to boredom.

### Daydreaming Propensity

Daydreaming may perform an adaptive function for those in monotonous jobs by mitigating the effects of repetitive or stimulus-poor environments. When humans are denied stimulation from the outside they tend to produce more inner stimulation or to attend more actively to a stream of imagery. Attention to external channels normally has priority unless external stimulation falls below a level required to maintain arousal. Individuals differ in their propensity to daydream or engage in other private cognitive activities. Frequent daydreamers entertain a varied range of mental content (Singer, 1966) and are therefore more adept at supplementing restricted environmental stimuli with inner stimuli, thus helping them to better tolerate a boring situation.

Anecdotal descriptions of boring jobs, such as the excellent accounts by Garson (1975) and Runcie (1980), attest to the frequency of daydreaming on the job and its value to assembly-line and continuous-process workers. Fantasy is one of the more benign strategies that may be employed to escape boredom. Depending upon its effectiveness and the extent to which task structure allows it to occur, daydreaming may provide one explanation for the person who does not report being bored in a monotonous environment.

## Task and Job Variables

Situational variables account for much of the variance in responsive boredom. When boredom is work-related, situational variables can be defined in terms of job characteristics. In the following discussion, these are categorized as objective task variables and subjective job characteristics. Underutilization of skills is seen as a bridge between the two categories.

### Underutilization

Even the most satisfying jobs are sometimes boring--if exceptions exist, surely they must be rare. Csikszentmihalyi's (1975) chapter devoted to the experience of performing

monotonous laboratory task. Intelligence was not related to self-reports of boredom susceptibility. Finally, an Army study (London et al., 1972) assessed intelligence using the general intelligence score from the Army General Classification Test and required enlisted men to perform two laboratory tasks providing low interest in one condition, high interest in the other. Rated boredom on the low-interest task correlated .33 with intelligence. More intelligent men may have found the task boring because they were able to process the information too rapidly to fill their time, while less intelligent men may have perceived the time to be comfortably filled.

### Demographic Variables

Age. The inverse relationship between age and boredom, while not particularly strong, applies to both men and women and was found consistently across all studies reviewed. Age is also negatively correlated with Boredom Susceptibility as measured by the Sensation Seeking Scales subscale. Older workers also report increased job satisfaction and fewer negative attitudes toward work (Stagner, 1975), which, in the absence of longitudinal studies, could be related either to aging or to adaptation to the work situation.

Gender. Gender differences in reported boredom have not been widely addressed. On Zuckerman's Boredom Susceptibility scale, however, females score slightly lower than males of the same age.

Race. No data are available for differences in reported boredom by race. Kurtz and Zuckerman (1978) administered the Sensation Seeking Scales to black and white college students, both male and female, and found that blacks of both sexes scored lower on Boredom Susceptibility than did whites. Race differences were more significant than sex differences.

Socio-economic Status. The only data available on effects of socio-economic status on boredom come from Robinson (1975) in his study of school-related boredom in adolescents. Students from lower working-class backgrounds were found to be more bored with school. Possibly because of family values, role models, and individual needs, these students may have failed to perceive much meaning or value in the educational experience or the classes offered.

### Autotelic Personality

In one of the few scientific explorations of the experience and processes associated with enjoyable activities, Csikszentmihalyi (1975) describes several ways to differentiate between enjoyable and boring activities. In his model, enjoyable activities are called "autotelic" or "flow" experiences. Autotelic or flow experiences rely on intrinsic rewards, although extrinsic rewards may be present but secondary in importance. For example, artists may paint for the creative expression, although they may also get paid for their work. These experiences are not confined to leisure activities or play. Many job activities involve physical or intellectual pursuits similar to those found in leisure activities. Under autotelic or flow conditions, individuals are poised between boredom and anxiety and are completely involved with the activity (Csikszentmihalyi, 1975, pp. 35-36). Elements common to flow activities include: appropriate levels of challenge so that the activity is perceived to be within one's ability to perform while making full use of skills; coherent, noncontradictory demands for action with clear feedback; no requirement for goals or rewards external to itself although they may be present; and strong involvement in the activity, with a centering of attention or concentration. Ideally, these

## Neuroticism

Based on the accumulated evidence, O'Hanlon (1981) concluded that within the same monotonous occupation workers who complain of chronic boredom tend to be more neurotic and otherwise less mentally healthy than those who do not. In the Hill study of female workers, neuroticism was the best single predictor of boredom, but the relationship, while significant, was relatively weak. Stagner (1975), while citing the lack of research related to personality variables and boredom, also stressed neuroticism or low ego-strength as being of relevance to understanding the problems of boredom at work.

## Intelligence

People think about intelligence in relation to boredom in two opposing ways. The first is a "workaholic truism" (Kopp, 1982) that presumes that no bright, energetic person need ever worry about being bored. The second has been more widely accepted: The more intelligent individuals are, the more easily they will be bored by routine jobs. People who take that position generally believe that the problem is resolved by self-selection--intelligent individuals do not settle for such jobs. However, monotony is no longer confined to the factory assembly line; bureaucracy and technology have combined to reduce vast numbers of jobs to an unprecedented level of routine. A better-educated work force has also meant that increasing numbers of low level jobs are now being filled by people who are overqualified by reason of education and whose expectations have exceeded their opportunities.

Differences in the way intelligence is measured may account for some confusion in the literature on boredom and intelligence. Attained educational level is often used as an index, although the range within any one job is likely to be fairly restricted because most workers in this country have a high school education. When jobs demanding higher education are considered, lower levels of reported boredom seem more likely to be a function of the job than of intelligence. Occasionally, standard measures of general intelligence have been used, although their cost and administrative difficulty often make them impractical. Additionally, different aspects of intelligence appear to be differentially related to boredom. Creative people, for example, experience less boredom while those high in problem-solving skills and deductive reasoning are likely to be more bored on simple jobs (Schubert, 1978).

Research on boredom and intelligence has been conducted in schools where the tasks offered variety and were relatively complex (Fogelman, 1976; Robinson, 1975); in work settings where jobs were repetitive and simple (Drory, 1982; Hill, 1975a; Smith, 1955); and in laboratory settings where contrived tasks were simple and monotonous (London, Schubert, & Washburn, 1972; McBain, 1970). Overall, a strong association between boredom and intelligence received mixed support. Robinson (1975) concluded from his investigation of high school students in Britain that high intelligence offered some immunity against boredom at school, but students with lower ability scores were not necessarily more bored. To assess intelligence, Drory used educational level and report of participation in "intellectual" leisure activities in his study of long-distance truck drivers (all male) driving a monotonous and familiar stretch of road. He found subjective boredom to be somewhat greater for men of higher intellectual abilities, but their performance was not affected. Both the Hill and Smith studies of women in low-skill jobs with little variety found no relationship between intelligence and boredom. Hill used as his measure of intelligence the Raven's matrices test; Smith based her measure of intelligence on educational attainment. McBain also used the Raven matrices to measure intelligence of a male sample of long-distance truck drivers, but assessed boredom on a

summary discusses personal traits which appear to merit further attention in research related to boredom.

Boredom-proneness

The only published scale attempting to measure boredom susceptibility is one of the four factor subscales which make up the Zuckerman Sensation Seeking Scales (Zuckerman, 1979). The fourth factor, called Boredom Susceptibility, "reflects an aversion for repetitive experience of any kind, routine work or dull and boring people, and extreme restlessness under conditions when escape from constancy is impossible" (p.103). This factor has been well-defined with male samples, less so with females. Although much research has been performed to refine the Sensation Seeking Scales, establish reliabilities, validate the scales against similar measures and with various samples, and assess the relationship between the Sensation Seeking Scale factors and other traits or attitudes, little or no work has been done to confirm that Boredom Susceptibility does, in fact, predict reported boredom in field settings. The one relevant study that correlated ratings on Boredom Susceptibility with self-reported boredom in a particular situation did not find a significant relationship (Tushup & Zuckerman, 1977).

In a similar effort conducted in the U.S. and Australia, Sundberg and Bisno (1983) developed a boredom-proneness scale that correlated with Zuckerman's Boredom Susceptibility subscale at a modest .35 level. Although the scale is still developmental, encouraging results have been obtained, including correlations with self-ratings of boredom from .57 to .89, and test-retest reliabilities of .49 to .75. Although much more research is needed on the boredom-proneness scale, the promise of a reliable and valid measure of boredom is of considerable scientific interest.

Extroversion

Because extroverts are assumed to require relatively more sensory stimulation, hypothetically they should experience greater boredom and fare worse on jobs with little variety. Although this hypothesis has often been presented as an established fact, tests have provided almost no validation for it. A modest correlation between Zuckerman's Boredom Susceptibility scale and the Eysenck measure of extroversion (Eysenck & Eysenck, 1968) has been established, but does not support the hypothesis because the relationship of the Boredom Susceptibility scale to boredom self-reports is still unknown. Also, only the impulsivity subscale of the extroversion measure was positively correlated with Boredom Susceptibility; the sociability subscale did not correlate with it.

Both Smith (1955) and Hill (1975a), working with female subjects engaged in a monotonous industrial task, found no support for the hypothesis that extroverts are more prone to boredom. A second study by Hill (1975b) may provide an explanation for this lack of relationship. When Hill compared a group scoring high on extroversion with a matching group of introverts both engaged in the same monotonous laboratory task, he found that the extrovert group used significantly greater response variability in performing the task. Further, the extrovert group progressively increased the variability of their responses over the course of the experiment while the introverts did not. Thackray, Jones, and Touchstone (1974) found response variability resulting from lapses of attention on a monotonous serial-reaction task to be greater for extroverts, particularly those scoring high on an impulsivity subscale, than for introverts. Extroverts may be successful in avoiding boredom because they build the additional variety they require into their performance. If vigilance is necessary, however, response variability may be too high a price to pay for avoiding boredom.

operative, a hypothesis that some jobs are so dull and restrictive that they inhibit normal human development and eventually lead to apathy in all areas of life is not unreasonable.

If two distinct forms of boredom exist, they cannot be clearly distinguished on the basis of either frequency or intensity. Some individuals do live a life of almost constant boredom because the circumstances of their lives are boring. Additionally, either chronic or responsive boredom may reach a pathological level. In sensory deprivation studies, for example, distortion of thought processes has been reported as a result of prolonged exposure to a monotonous environment. Admittedly, conditions of such experiments are extreme; however, similar experiences have been reported by people holding jobs which involve long periods of isolation and reduced stimulation. Pilots and long-distance truck drivers, for example, have described instances of cognitive and perceptual disorganization (Heron, 1957). With current trends in technology pointing to more jobs that are both isolated and automated, the need to cope with pathological levels of job-related boredom is likely to increase in the future.

### Restless/Listless Boredom

Fenichel (1951) conceptualized a motor-restlessness/calm dimension of boredom which has subsequently been adopted by most theorists as a basic dimension, observationally verifiable in both responsive and chronic forms. Restless boredom is marked by jumpiness, overt body movements, and jitteriness. It may be associated with high autonomic arousal and is probably related to constraint coupled with a desire to be doing something else. Listless boredom may reflect a low cortical arousal and reversion toward a sleep state, observed as drowsiness, apathy, or withdrawal. The terms "restless boredom" and "listless boredom" were suggested by Sundberg and Bisno (1983) who use the restless/listless dimension to describe both the eliciting situation and reactive behaviors. They propose two additional types of boredom: satiated or contrast boredom and covered-up boredom. The first refers to experiencing the contrast between a stimulating event and normal routine, while covered-up boredom represents a denial of being bored despite evidence of lack of interest in the activities of life.

The restless/listless dimension may be describing strategies to cope with boredom, rather than boredom itself. Restlessness, for example, might reflect one way to introduce variation into a low-stimulus situation through finger-tapping, fidgeting, or tensing muscles. According to Bernstein (1975), restlessness is a sign that the individual is maintaining a struggle for feeling or involvement. Both situational and personality variables may determine the physiological processes and reactive behaviors reflected in restlessness or listlessness.

### Personal Characteristics

Why, given the same surroundings and the same sources of stimulation, do individuals report different levels of boredom? What characteristics typify the person who is more easily bored than others? The idea that boredom-prone individuals can be identified by a cluster of personality traits has been widely accepted even though that personality has not been reliably identified. Research on boredom-proneness has been hampered by disparate conceptualizations of the construct itself, and so has received little attention. The relationship between boredom and several other traits that have adequate measures has also been examined with mixed results. Prominent among these are the personality dimensions of intelligence, neuroticism, and extroversion. The suggestion of an autotelic personality trait (Csikszentmihalyi, 1975), although currently not well-defined, offers a promising alternative for looking at individual differences in boredom. The following

less efficient behavior. London and Monello (1974) investigated whether experimentally-induced perceptions of the rate of passing time would affect the labeling of a task as interesting or boring. They found that subjects who were convinced--by means of a rigged clock--that time was passing slowly were more likely to label the task as boring. In a more recent study, the boredom-slow time relationship was modified by the introduction of volition or choice (Troutwine & O'Neal, 1981). Subjects in a no-volition group judged an interesting task to be shorter than a boring task when elapsed time was the same, while those in a volition group perceived no time differences as a function of task quality.

Contradictory results were reported by Kerr and Keil (1963) who found that estimated time-drag was more pronounced in jobs with greater variety and longer cycles than in jobs that were more repetitive and short-cycled. These results were attributed to the greater number of "markers" in the jobs with variety (i.e., breaking up the temporal space through variety made the time appear to be longer).

An explanation for why time appears to pass more slowly when one is bored is offered by London, Schubert, and Washburn (1972). They hypothesize that autonomic arousal causes an internal "pacemaker" to emit more signals, which then leads the individual to believe that more time had passed.

## Dimensions of Boredom

Along with attempts to specify the complex, multifaceted structure of boredom, dimensions of the phenomenon which reflect its behavioral manifestations are also useful. Two such dimensions have been identified:

### Responsive/Chronic Boredom

Some people report that they are never bored. Most people are bored some of the time, especially when performing tasks with little inherent interest or stimulation. For others the condition is chronic; their lives are marked by a pervading malaise. Are the individuals in the latter category only experiencing more, or more frequently, the same psychophysiological state that others feel some of the time, or do two different forms of boredom exist? Bernstein (1975) argues convincingly for two distinct forms--responsive and chronic. Responsive boredom occurs in response to the environment, while chronic boredom (usually discussed from a psychoanalytic perspective) reflects a developmental ego defect of the individual. Responsive boredom fits the pattern defined by O'Hanlon (1981) who suggests that the state of boredom occurs as a reaction to task situations, can occur within minutes after the commencement of repetitive activity, is highly specific to a situation, and is immediately reversible when the situation changes.

Theorists concerned primarily with chronic boredom (e.g., Esman, 1979) characterize it as a habitual repression of instinctual aims with a subsequent flatness of affect and continual need for outside stimulation associated with a restriction of fantasy (Fenichel, 1951), often resulting from an emphasis on early socialization at the expense of emotional development (Bernstein, 1975). However, an ecological explanation that considers how continued exposure to restricted, unstimulating and stressful work may affect other areas of an individual's life provides a viable alternative to the psychodynamic orientation. For most people work provides meaning to life, and research supports the inability to compartmentalize one's job and other aspects of life. For example, Strauss (1974) noted that workers in jobs that are objectively less challenging (as well as those most dissatisfied with their jobs) reported less satisfying and interesting lives overall. Although the causal direction of this association is not clear and other factors may also be

## Monotony

Monotony has often been used synonymously with boredom. For example, Smith (1955) used the two terms interchangeably to designate "an experience which arises from the continued performance of an activity which is perceived as either uniform or repetitive" (p. 322). For other researchers, such as McBain (1970), monotony is not a term to describe an individual's experience but is reserved to indicate an objective and measurable dimension of the stimulus situation. Monotonous conditions would be those present whenever stimuli either remain unchanged or change only in repetitive and predictable ways. Thus, the term can be used in describing situations with various cycle times if they offer a predictable pattern of stimuli or recurring tasks. Boredom would then be one of several possible outcomes of a person's experience with monotony. Defining monotony as a situational variable seems to facilitate a better understanding of the person-environment interaction and suggests that monotony is necessary but not sufficient for that relationship.

## Constraint

Barmack (1937) employed the term constraint to help distinguish between satiation and boredom. Satiation occurs when one is free to stop an activity and chooses to do so, and boredom occurs when the activity must continue after negative feelings about it have developed. Presumedly, boredom would not occur without constraint. Fenichel (1951) saw constraint as central, describing responsive boredom as "when we must not do what we want to do, or must do what we do not want to do" (p. 359). Constraint can mean remaining in one place or can involve the inhibition of impulses which conflict with task requirements. Geiwitz (1966) found that constraint is more strongly associated with the experience of boredom than either repetitiveness or unpleasantness.

## Unpleasantness

Boredom is assumed to be unpleasant, and many reports from individuals support this assumption. Unpleasantness also distinguishes boredom from satiation. Experienced individually, both high and low arousal as well as monotony and effort may all be pleasant under some conditions for some individuals. When combined, as in boredom, they are unpleasant, either due to an approach-avoidance conflict (Smith, 1981) or, as Tushup and Zuckerman (1977) suggest, to an unpleasant pattern of arousal; that is, low cortical arousal requiring effort in order to perform interspersed with high arousal under constraint, which brings on irritation and restlessness. On the other hand, Cox and Mackay (1979) found the pleasant-unpleasant factor to be independent of the tedium (boring) factor and concluded that a situation may be boring without necessarily being perceived as unpleasant.

## Distorted Time

The popular conception that time passes slowly when one is bored has received only modest empirical verification. Geiwitz (1964), in a single-subject experiment, found that hypnotically-induced states of boredom lengthened the subjective duration of elapsed time periods of five and ten seconds. McBain (1970), in a study involving long-distance truck drivers, found that underestimation of elapsed time on a simulated task was related to a composite derived from peer and supervisor ratings of the driver's boredom susceptibility and skill, and concluded that fixating on the task more narrowly (as opposed to the introduction of response variability) may lead to a perceived slower passage of time and

contributes to feelings of boredom, although one or more may be missing under some circumstances. Because these relationships were tested in the laboratory with levels of boredom induced by hypnotic suggestion, testing the underlying assumptions in field studies is essential. His work does suggest, however, the value of additional research of boredom based upon the idea that it is a multifaceted construct.

The factors described in this section represent a preliminary effort to define boredom. Alternate components (or perhaps clearer labels) may emerge from additional research.

Arousal Level

Most discussions of boredom assume that arousal plays a central role; however, the level of that arousal is a matter of controversy. In Barmack's (1937) definition, arousal is presumed to revert back to near-sleep level under low-stimulus conditions. Hebb (1955), Fiske and Maddi (1961), and Thackray (1981) also favor a low arousal hypothesis. Berlyne (1960) proposes an alternate high-arousal model based upon inactivation of the cortex in response to low sensory stimulation, followed by release of the reticular arousal system and a subsequent return to a high level of autonomic arousal. He argues that a person in the throes of boredom does not look like one with low arousal, but instead exhibits restlessness, agitation, and emotional upset. Studies measuring physiological variables (e.g., Bailey et al., 1976) have supported both positions, while current opinion favors the idea of at least two separate but integrated arousal systems as an explanation for the lower cortical arousal and increased autonomic or subcortical arousal typically observed under conditions of boredom (London, Schubert, & Washburn, 1972; Pribram & McGuinness, 1975; Routtenberg, 1968). Geiwitz (1966) concludes that this conceptualization has resolved the boredom-arousal controversy and suggests that such disagreement has been partly a "semantic illusion" (p. 599).

The related concept of effort represents a motivational aspect of the arousal-boredom-performance relationship. Effort functions to maintain cortical arousal when the available sensory stimulation allows it to fall below a task-optimal or person-preferred level. Effort variation among individuals thus helps to account for performance differences under the same boring conditions. The effort to maintain performance may be a source of much of the unpleasantness associated with boredom and may also contribute to psychological strain and physiological changes. The amount of effort an individual is willing to expend is influenced by both objective and subjective job characteristics.

Fatigue

The feeling of fatigue frequently reported as an aspect of boredom may result from the effort required to attend to a task offering only restricted stimulation (O'Hanlon, 1981). Boredom-related fatigue can apparently be distinguished from "normal" fatigue by its more rapid onset and by a more rapid recovery when the task is stopped. Often a performance decrement of which the individual may be largely unaware accompanies the fatigue. Rest periods can temporarily restore performance efficiency under such conditions (O'Hanlon & Kelley, 1977).

The time allotted to experimental tasks designed to assess fatigue, boredom, and performance relationships in the laboratory has generally been quite short, typically less than 30 minutes. The results of such studies suggest that fatigue is experienced under brief but boring conditions, as well as in sustained or demanding job situations where normal fatigue might be expected.

is unmistakably associated with the superior mental health at low job levels" (p. 99). A link is thus provided to the Caplan et al. (1980) cross-sectional study wherein boredom was best predicted by the job stresses of underutilization of skills ($r$ = .59) and poor fit on the job-complexity dimension ($r$ = .51).

## Generalization of the Effects of Boredom

Although feelings of drowsiness, fatigue, restraint, or restlessness resulting from boredom can be temporarily reversed upon the cessation of a task, boredom may have a more general and lasting influence on other aspects of a person's life. Students in both Fogelman's (1976) and Robinson's (1975) studies who were bored with specific subjects tended to generalize their negative feelings to encompass all aspects of the school environment. A relationship between work-related boredom and general dissatisfaction with the job has been supported by the Caplan et al. (1980) survey, where boredom was strongly related to overall job dissatisfaction ($r$ = .63). Similarly, 80 percent of a group of Swedish workers who found their work boring were generally unhappy with their jobs, while only 30 percent of those who rated their work interesting were generally dissatisfied (Gardell, 1971). More importantly, the Swedish workers who were bored at work were significantly less satisfied with life in general, reported greater anxiety, and complained more about vague medical problems.

Such relationships raise questions about the direction of causality, particularly because the quality of leisure activities often parallels that of work activities; that is, people in the most boring and restricting jobs do not attempt to compensate with stimulating activities when not working (Gardell, 1971; Kohn & Schooler, 1973). Because findings such as these strengthen the popular belief that apathetic, dull people drift into boring jobs through a process of natural selection, the intellectual and emotional costs of adjusting to daily boredom at work have been largely ignored.

Kohn and Schooler (1973) have argued convincingly that adult occupational experiences affect--rather than reflect--their psychological functioning. Specifically, they found that the substantive complexity of one's job is consistently more important for psychological functioning than the reverse. Finally, in sensory deprivation investigations, temporary impairment of perceptual and cognitive functioning has resulted from comparatively long periods of restricted stimulation. Whether degradation of cognitive functioning occurs as a result of less extreme stimulus restriction is yet unanswered.

## Components of Boredom

Constraint, monotony, changes in arousal level, feelings of unpleasantness, and distortions of time have all been identified as playing a part in a boring experience, yet no one of these can fully explain the phenomenon. Because all are implicated to some extent, confusion occurs when they are individually used as synonyms for boredom. In any situation experienced as boring, one or more of the above components will be salient; however, little is presently known about their relative importance or whether any of them is either necessary or sufficient for boredom to result. Thus, although the average person has little difficulty distinguishing boredom from related states, efforts to reduce the potential for boredom will continue to be hampered until the various components are more clearly understood.

Geiwitz (1966) is one of the few researchers who has attempted to define boredom in terms of its many components, contending that no single factor or component is necessary or primary in all situations. He concluded that a combination of factors normally

mitigated by personal abilities (i.e., more education, experience, etc.). Although individuals with more education were bored more frequently, their boredom was less likely to be reflected in a performance decrement.

In a second investigation of truck-driving performance under monotonous conditions, errors made on a boring laboratory task predicted job-related accident rates (McBain, 1970). Study results suggested that effective individuals often cope with a boring task by introducing response variation. Subjects who had the safest driving records and made the fewest errors on the laboratory task were those who were least consistent in response times and more likely to vary speeds during sustained driving periods.

Effects on Health

Perhaps the topic of boredom has engendered little research because its effects on the individual are considered relatively minor and temporary. Only recently have the costs been considered to the individual seeking to maintain performance in situations of habitual boredom. Stress research has helped to show that, beyond a certain threshold, any type of stressor can produce harmful effects. Thus, underutilization and understimulation may affect well-being as much as excessive or ambiguous demands. Depending upon the model employed, boredom has been labeled as a stressor or as a psychological strain resulting from stress found on the job and ultimately leading to both immediate negative physiological changes and longer-term effects on health. Boredom per se has not been directly related to illness; however, one survey found higher scores for both physical complaints and boredom within the same occupations (Caplan, Cobb, French, Harrison, and Pinneau, 1980). Mechanical assemblers and forklift drivers, for example, had the highest incidence of reported boredom and physical complaints. Physicians, professors, and scientists reported a lower incidence of both. The relationship between physiological measures and reported illness could not be examined because of the small sample on which physiological data were available.

The relation between subjective reports of boredom and physiological changes is still far from settled. Few studies have shown a clear relationship between physiological changes, monotonous jobs, and the experience of boredom. The interpretation of observed physiological changes is complicated by individual differences in physical condition and other confounding factors. Bailey, Thackray, Pearl, and Parish (1976) best summarize the inconsistent data when they conclude that boredom is experienced as a complex response pattern accompanied by a variety of physiological changes.

The relationship between boredom and mental health appears equally complex and, at this time, can only be inferred. Almost 20 years ago, Kornhauser (1965) documented the relationship between types of work, job feelings, and mental health. In his model, job feelings were the crucial intervening process between the kind of work done and the level of mental health. Based on a sample of both white collar and skilled and unskilled blue collar workers in industrial factories, his data clearly indicate that workers in routine jobs generally have less satisfactory mental health; those in more skilled and varied jobs have better mental health. Further, these results were largely due to the jobs themselves and not to employee characteristics.

Additional analyses investigated which personal characteristics associated with routine jobs were most strongly related to mental health. Interest in the work itself and the opportunity to use individual abilities had a strikingly positive bearing on mental health, even for those doing the same kind of work. In Kornhauser's opinion, his data left no doubt that the variable measuring "workers' feelings regarding the use of their abilities

- A personality trait measure of boredom-proneness appears less useful for predicting boredom at work than situational variables .

- Both subjective and objective job characteristics impact boredom. Objective job characteristics of repetitiveness, reduced complexity, insufficient stimulation, isolation, constraint, unpleasantness, and extreme predictability contribute to the experience of boredom. Among subjective characteristics, underutilization of skills is a major contributor to job-related boredom.

A Preliminary Model of Job-related Boredom

Figure 1 presents a preliminary model that integrates much of the research on job-related boredom. Through consolidation of various approaches, some conclusions have been made about what occurs when one is bored, that is, the components and dimensions of the phenomenon. Both sides of the person-job interactions have been included. Empirically-anchored interaction rules among the components are required, however.

Although limited, evidence that personality variables play a role in boredom is sufficient to justify their inclusion in the model. Boredom-proneness or susceptibility is included among the personality variables although it has not been validated and may have little pragmatic value for work-related applications.

The model specifies the objective task/job variables that are theoretically associated with components of boredom. At the same time it assigns equal importance to subjective job variables, which represent an alternative point of intervention when changes in objective task variables are not feasible. The importance of subjective evaluations of a job has often been ignored; however, they may exacerbate or help to minimize the boredom potential represented by objective task variables. For example, the perceived degree of meaning or importance of a job plays a part in determining effort and maintaining arousal.

Coping strategies, such as creating response variation, subsidiary behaviors, or ideation, influence boredom in two ways. First, they influence the interaction between personal and job characteristics to change the level of boredom experienced; and second, they mediate the relationship between boredom and its consequences.

The association between boredom and its consequences is one of the weakest links of the model, partly because performance on simple, repetitive jobs has routinely been assessed in conjunction with satisfaction measures rather than self-reports of boredom. The relationship between boredom and performance outcomes may be further obscured by the effects of effort, ability, and coping strategies.

## IMPLICATIONS FOR PERSONNEL SELECTION AND JOB DESIGN

Although the literature review and the model are applicable to work-related boredom in general, the problem is acute for jobs typified by stimulus restriction and repetitiveness during long periods when only low-level skills are required, but which demand the ability to respond rapidly and effectively in emergencies. Isolation and constraint are often significant factors as well. Jobs of this kind include security guards, critical-instrument monitors, and long-distance drivers. Although not generally considered low skill occupations, pilots during instrument flights and air traffic controllers under certain conditions must also perform with similar fluctuating demands.

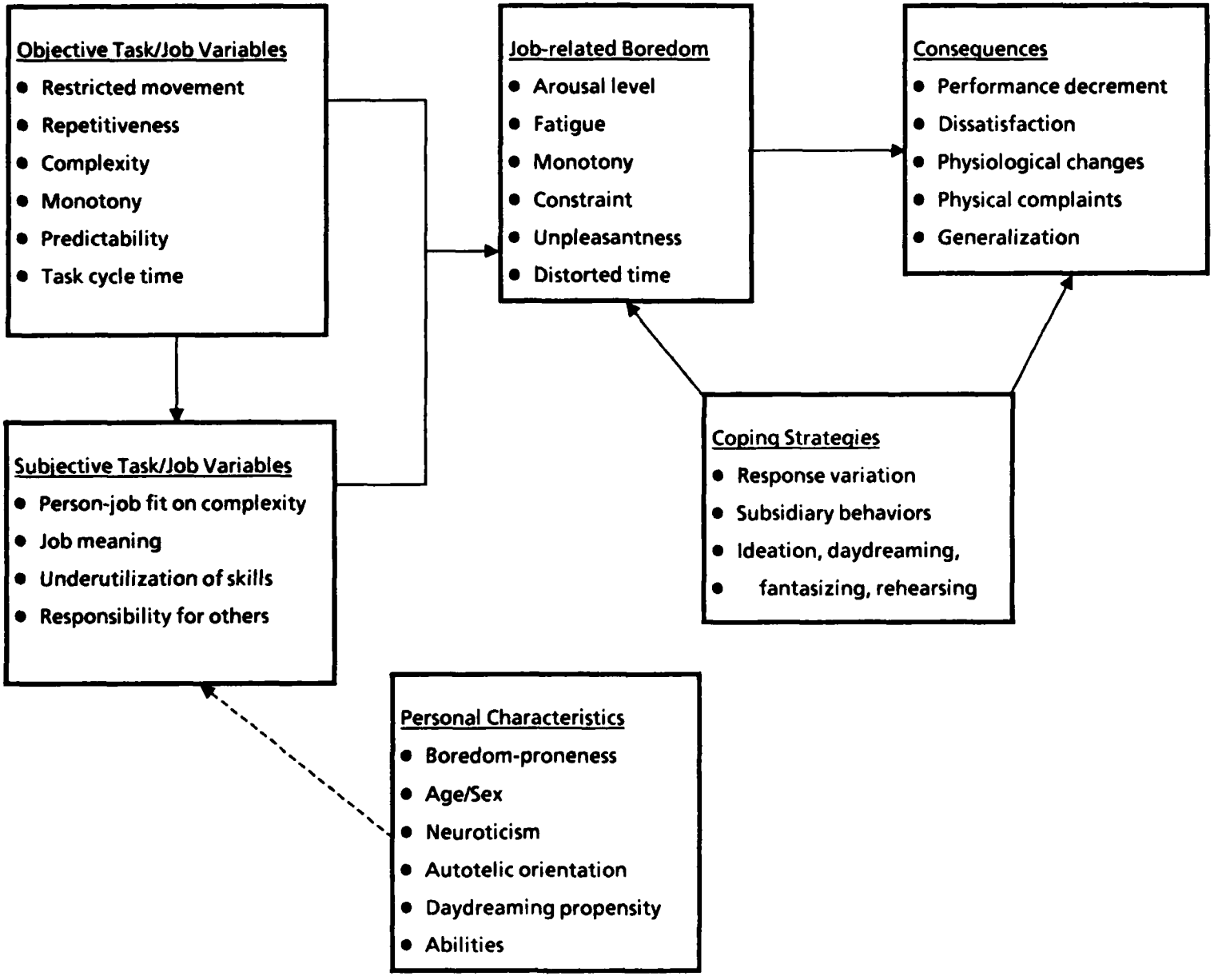


Figure 1. A preliminary model of job-related boredom.

The following recommendations are tailored to jobs such as military security guards in which cognitive arousal and motivation must be maintained at a sufficient level to assure prompt and appropriate responses when required.

Selection

One approach might be to select individuals who would be least likely to become bored during periods of low stimulation. Selection strategies, however, may represent the least feasible approach for several reasons, including:

1. Elimination of the population most likely to be bored, that is, younger males, would place a severe strain on the available labor pool for many jobs, especially in the military and for those jobs filled from the lower ranks.

2. The cognitive demands of many tasks are sufficiently restricted so that they would underutilize the skills of almost any functioning adult after minimal training.

3. Available measures of boredom-proneness or boredom susceptibility can contribute little because of relatively low reliability and low correlation with reported boredom on the job.

Selection, used in combination with other strategies, does have the potential to make some contribution to improved performance. Measures of extroversion and neuroticism or emotional lability may be useful in predicting those who would experience the most intense boredom. Those scoring high in neuroticism might also represent a poorer risk in crises.

One option that appears promising begins with selection on the basis of a predisposition for imaginal processes, followed by training to channel that willingness to fantasize away from personal daydreams toward ideation to help maintain a readiness for action. For security guards, this technique might involve visualization of sources of threat and cognitive rehearsal of appropriate responses. The strength of covert stimulation activities could be measured using the Imaginal Process Inventory developed by Singer and Antrobus (1972). Predictive ability should be enhanced if this measure is used in conjunction with an assessment of neuroticism.

In considering the role of selection for staffing boring jobs, Drory's (1982) reminder that a trade-off must be made between maximizing performance and maximizing satisfaction is valid, especially when considering general intelligence requirements. However, those who are better qualified overall could be selected and the objective task variables altered to reduce the potential for boredom below reasonably tolerable levels.

Redesigning Jobs

A number of the following suggestions are similar to those associated with job enrichment intervention. The most successful job enrichment experiments, however, have generally had more latitude to provide for "vertical job loading" (Herzberg, 1968) than may be possible for some jobs having the greatest boredom potential. For example, significant increases in autonomy or decision-making opportunities are not always possible in lower level jobs. This lack of opportunity for vertical loading does not necessarily mean that such jobs cannot be improved. Identification of the sources of boredom can go far to guide job redesign where broader enrichment strategies may not be possible.

## Modifying Objective Task Variables

The redesign of jobs to reduce boredom through structural changes requires detailed analysis to determine the components of boredom inherent in a situation. Objective task variables that can be associated with the boredom components are the appropriate targets of change. After assessing feasibility and needs, one or more of the following strategies might be employed:

- increasing the frequency of stimuli
- increasing the complexity of stimuli
- increasing the variety of stimuli
- modifying physical restrictions or contraints

Techniques for implementing changes in any of these areas will vary from one task cluster to another.

Increasing the frequency of stimuli is particularly relevant to jobs characterized by long stretches of "empty time" (i.e., duties that demand remaining in place and alert when nothing else is required) and often under conditions of isolation. Additional tasks that are not excessively distracting can help to break up long stretches of time and thus help to maintain arousal.

Increasing the complexity of stimuli is the technique most useful in combating over-simplification of jobs. Complexity reduces boredom both through effects on arousal and indirectly by reducing feelings of unpleasantness. Although additional complexity may be unpleasant, the effort required to offset habituation may be more unpleasant. Either of these techniques must be implemented with caution because workers are particularly sensitive to changes that appear to make busy work. Changes that appear contrived and superficial will meet resistance and are unlikely to achieve the desired results.

The actions that workers take on their own to cope with boredom emphasize the importance of stimulus variety. Researchers have observed that people frequently trade jobs for some specified period of time or double-up for a while, with each worker then performing both his or her own job as well as that of the other. Structured changes incorporating a team approach to a cluster of jobs generally have had some success. This strategy appears to work best when each worker is capable of performing all tasks and a rotational system allows the members to alternate positions.

Whenever physical constraint can be relaxed to allow greater freedom of movement, the potential for stimulation is increased. When not possible, frequent rest breaks perform much the same function in maintaining arousal by allowing movement. They are most essential when constraint is a salient component of boredom. Unfortunately, supervisors often regard breaks as a required nuisance that cuts into productive time, yet on boring, repetitive jobs they help to maintain productivity. Whenever possible, breaks should be scheduled to coincide with the onset of habituation and the associated decrease in arousal; the timing of breaks will depend upon the repetitiveness of the task.

## Modifying Subjective Job Characteristics

A worker's subjective perceptions of a job can mitigate the effects of objective task variables to keep boredom within reasonable bounds. Often changes in subjective job characteristics are more feasible than changes in objective ones. In the preliminary model of boredom, subjective characteristics include underutilization of skills, the

meaning of the job for the individual, and factors associated with intrinsic motivation. In general, intrinsic motivation to perform is antithetical to the experience of boredom so that, to the extent it can be facilitated, boredom should be decreased.

Underutilization of Skills. Underutilization of skills is a strong predictor of job-related boredom and one that may be difficult to overcome for a wide spectrum of jobs. To avoid the consequences of underutilization, challenges must be introduced in increments sufficient to stimulate interest without anxiety. Because this becomes more difficult as the individual attains task mastery, a strong orientation to career development should be emphasized to compensate for the perception of current underutilization. For example, training modules related to the next step in the career ladder which are integrated into current job duties should help maintain the necessary level of challenge. Training materials should be designed to add both variety and complexity to a job in addition to the inherent challenge of learning new skills.

Mossholder (1980) suggests that imposing specific goals may also be an effective way to increase the challenge of boring jobs. For example, setting weekly production goals that are challenging to meet may be less boring than open-ended requirements to perform a repetitive task such as assembling circuits. Although Mossholder investigated externally mediated goals in conjunction with a laboratory task, goals established by all participants should be even more effective in increasing interest.

Factors Facilitating Intrinsic Motivation. Recent research (e.g., Deci, 1975) suggests that intrinsic motivation can be facilitated or repressed by factors other than whether the task itself is interesting to the individual. A moderate level of challenge is only one facilitator. Other factors include self-control or self-determination and participation. Self-control over certain aspects of scheduling, cycle time, or details of how the task is to be accomplished allows the worker to introduce response variation to help maintain arousal. Participation adds to feelings of self-determination and counteracts boredom by facilitating involvement. Supervisory style has a significant influence on the perception of self-determination. Previous research has shown that the more boring the job the less structured the supervisory style should be if intrinsic motivation is to be enhanced (Kerce, 1980).

Job Meaning. The effects of boredom are somewhat diminished if the job itself is perceived as being meaningful or having social value. This aspect should be emphasized whenever possible. One prominent factor in job meaningfulness for the individual is the degree of responsibility for others. Although all military security guards may be aware that such responsibility is an inherent characteristic of their jobs, those at lower levels may assign such responsibility only to their superiors. Each individual's contribution must be emphasized if such responsibility is to be internalized. At the same time, stressing the interdependence of jobs within a unit helps to promote feelings of responsibility for the welfare of fellow workers. Subjective meaning can also be affected by the perception of belonging to an elite group distinguished either by special training, unique talent, or subtle style differences in the performance of duties. To the extent that efforts to emphasize the responsibility, value, and uniqueness of the job are successfully internalized by group members, the effects of boredom can be minimized.

## Teaching Coping Skills

A recent development in combating job-related boredom has been to modify or teach skills for coping with boredom. The behaviors that workers spontaneously initiate for this

purpose are often considered to impact performance negatively because they divert attention from the task. One strategy would be to enhance the behaviors that individuals find beneficial but to rechannel them in forms consistent with organizational goals. It is based on the idea that those who cope with boredom best are individuals with a strong autotelic orientation or those who are most adept at imaginal processes. Appropriate training in covert reinforcement techniques may be useful in increasing autotelic orientation, and personal fantasies and daydreams might be replaced by such ideations as rehearsal for emergencies.

Exploratory efforts to develop programs for training in coping with boring situations are currently underway. One such program is presently being implemented by a major corporation, where lower level employees are being trained to devise their own "games" to maintain interest and concentration on the task (Krier, 1983). Other programs still in the developmental stages concentrate on helping individuals to be self-rewarding and thus self-motivating. Here much of the self-reward results from the flow experience found in autotelic activities.[1] While training programs to reduce boredom have yet to be evaluated, interventions of this type appear promising. They represent an innovative application of principles similar to those used successfully in cognitive therapies for stress management (Meichenbaum, 1974)

## DISCUSSION

Two things are required in order for personnel working in stimulus-restricted conditions to respond quickly and appropriately in extraordinary or emergency situations: They must be able to do so and they must be motivated to do so. Boredom affects the ability to respond by decreasing arousal, which, in turn, affects both attentional processes and response time. The more intense the experience of boredom, the more the performance is likely to decline. Ways of minimizing the negative effects of a boring situation include developing more effective coping skills, providing increased stimulation, and maintaining motivation.

Motivation is maintained, in part, by a feeling of responsibility for others. Thus, although more qualified personnel may be available for backup when nonroutine situations occur, first level personnel should not perceive that their responsibility is shifted to others. Motivation can also be maintained by training in covert reinforcement and stimulation. Methods for this type of training need to be investigated. Finally, direct effort should be made at the task level to reduce its potential for boredom.

Can anything be done about boredom at work? The answer is yes, but a qualified yes. Because all jobs cannot be redesigned to become intrinsically interesting, the potential for boredom will not totally disappear. The most urgent need is for more research, especially field studies. Next, organizational decision-makers must be convinced that boredom is not a trivial matter and understand that the needs of the organization as well as of its members can best be met if steps are taken to address this issue. Finally, any real impact will necessitate a multifaceted approach overall--no one intervention is likely to be effective in all situations. Furthermore, each job may require that more than one strategy be employed. With this kind of combined effort, boredom at work can be reduced.

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[1] J. Mosel, personal communication, April 9, 1984.

## CONCLUSIONS

1. Although the concept of job-related boredom is not fully understood, its study appears useful for improving performance on low-stimulus jobs as well as worker satisfaction with those jobs.

2. A theoretical model of job-related boredom that incorporates worker characteristics, objective task variables, subjective job characteristics, and coping strategies is useful for organizing the literature and for developing recommendations.

3. Although several approaches to combating job-related boredom are suggested by the literature, they require further testing in the laboratory and in the field.

## RECOMMENDATIONS

Further research is recommended in several areas:

1. Basic research on job-related boredom, measuring its components by self-report and by analyzing job and task variables so that the relative importance and interaction of the components can be determined.

2. Laboratory and field studies to explore the effects of training in coping skills, such as increasing intrinsic motivation or rehearsing for emergencies.

3. Field studies of the effects of interventions such as changing shift length or increasing job meaning within specific populations such as nuclear weapons security guards.

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